Lesson 12 - The Role Of Acid And Alkaline Substances Within The Body

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1. Acid-Base Balance

When we talk about acid-base balance, we are referring to the pH balance (degree of acidity or alkalinity) of substances or of the body. The symbol pH is used after numbers that measure the degree of the acidity or alkalinity of solutions. The acidity or the alkalinity of a solution is determined by the number of *hydrogen ions (H +)* it contains. The smaller the pH value of a solution; that is, the smaller the number preceding the symbol *pH* is, the greater is the acidity of that solution. Likewise, the larger the number in front of the symbol *pH* is, the greater is the alkalinity of the solution.

Any neutral solution, such as water, will have a pH value of 7.0. Solutions which have a pH value below 7.0 are acidic in nature. Solutions which have a pH value above 7.0 are considered to be alkaline, or basic.

The human body must continuously deal with many different substances in the bloodstream. Each substance has a range of concentration which can vary within certain limits without creating an imbalance of normal bodily functions. Certain substances, such as blood glucose, can vary up to 200%, while certain other substances, such as blood calcium, are constricted to a much narrower range of deviation.

The balance in the blood of acidic and alkaline components can be only moderately altered without creating a very serious physiological instability. Therefore, it is crucial that the body, while controlling degrees of pH in organs, glands and other areas of the body, simultaneously maintain this strict range of balance in the pH of the blood. The following chart best illustrates the pH ranges of different areas of the body:

Body Area	**pH Value**
Gastric Juice	0.9

Gallbladder Bile	5.4-6.9
Urine	6.0
Saliva	6.3-6.8
Feces	7.0-7.5
Intestinal Juices	7.0-8.0
Pancreatic Juices	8.0

The blood is slightly alkaline, with a pH of 7.35 to 7.4. Many of the enzymes that facilitate metabolic reactions operate optimally only in solutions of specific alkalinity. When there is a deviation from this level of alkalinity, whether higher (referred to as alkalosis), or lower (referred to as acidosis), severe malfunctions can occur. These malfunctions are manifested by slower enzymatic reactions, and thus a decrease in synthesis of specialized molecules, such as vitamins, proteins, etc. There is also an impairment of the production of ATP molecules that are needed for energy and are made from glucose.

The major effect of acidosis is disorientation due to the depression of the central nervous system. Inversely, the major effect of alkalosis is extreme nervousness, eventually leading to convulsive reactions, namely tonic spasm. This spasm is referred to as *tetany*, and usually develops primarily in the musculature of the forearm and face, then spreads over the muscular system of the entire body. Tetany results from over-excitability of the central and peripheral nervous systems due to alkalosis.

2. Body Maintenance Of Normal pH

In order to maintain a proper pH in the bodily fluids, and so that acidosis or alkalosis will not manifest, three major physiological control systems exist within the body. The first mechanism involves a buffer system for the hydrogen ion fluctuations. All bodily fluids are supplied with acid-base buffers which combine with any acid or alkaline substance and prevent excessive change in the hydrogen ion concentration.

Another mechanism the body uses to maintain normal pH is within the respiratory system. When the hydrogen ion concentration (H +) changes measurably, the respiratory system is immediately stimulated to alter the rate of pulminary ventilation. This brings about a change in the quantity of carbon dioxide (CO2) within the system. High levels of carbon dioxide in the system, as created when holding the breath or due to physiological impairments of respiration, increase the acidity of the bloodstream. Any disease that interferes with normal breathing, such as emphysema or asthma, will impede the release of CO2 from the lungs and, subsequently, this CO2 will combine with water to form carbonic acid. This increases the concentration of hydrogen ions, and thus the acidity of the blood is simultaneously increased.

The last of the three major physiological control systems of the body to maintain normal pH involves the

kidneys. When the (H +) (hydrogen concentration) deviates from a normal value, the kidneys excrete either an acid or alkaline urine. This serves to help readjust the (H +) of the bodily fluids back toward the normal value.

The key point to keep in mind when you are trying to understand the terms acidosis and alkalosis is that, as was previously mentioned, when the hydrogen ion concentration (H +) is above normal, there is a state of acidosis and when the (H +) falls below normal, we have alkalosis. If either acidosis or alkalosis occur within the bodily fluids, the buffer systems; namely, the lungs and kidneys, the organs that influence the acceptance or excretion of hydrogen ions, will attempt to regulate the imbalance. In a normal, healthy individual, any increase or decrease in (H +) will be modified so that the pH of the blood does not fluctuate from its normal range of 7.35 to 7.45. If, however, either the lungs or kidneys fail to function properly, the end result is often acidosis or alkalosis.

Acidosis and alkalosis both have numerous causes. As mentioned above, one or more of the body's buffer systems may be impaired in some way. Thus, acidosis or alkalosis may occur. Also, acidosis or alkalosis may result because of improper respiration (breathing), improper diet or both.

An example of respiratory alkalosis is when a person ascends to a very high altitude and proceeds to overbreathe because he is aware of the low oxygen content in the air. This overbreathing results in an excessive loss of CO2, referred to as a mild state of respiratory alkalosis. If such a situation persists and the individual fails to acclimate, eventually the balance of acid and alkalinity in the blood may be altered.

Both diarrhea and vomiting are considered to be some common causes of metabolic acidosis. During diarrhea, large amounts of sodium bicarbonate, an alkaline substance, are secreted from the gastrointestinal tract; and during vomiting, there is a loss of alkaline substances deep within the gastrointestinal tract.

However, diarrhea and vomiting are processes the body uses to speedily eliminate highly toxic materials from the body so these toxins cannot harm the tissues. Diarrhea and vomiting are not themselves causes of acidosis. Rather, they result from the same offending substance(s) that the acidosis results from.

It is important that you understand that body actions to expel toxic materials (acute illnesses, so-called "infections," fevers, etc.) are not harmful processes. What is harmful is what occasioned the body to perform in such an expedient manner.

As students of Natural Hygiene, you must realize that the pH balance within the body is a result of the entire physiology of the body working in harmony. So, while this lesson will deal primarily with dietary influences on pH, be aware that you must utilize all areas of Natural Hygiene. This includes not only diet, but also pure water, fasting, exercise, fresh air, sunshine and mental poise. All of these must be integrated to form a lifestyle which can allow the body to carry out its physiological duties as effectively and efficiently as possible.

To sum up what we have discussed in this section, the pH in the blood and tissues is directly related to the concentration of (H +) within the body. This range and balance of pH in the bodily fluids is quite narrow and delicate. Even slight deviations from these values can lead to major physiological complications. Several mechanisms, as expressed by *McNutt's Nutrition and Food Choices*, regulate this intricate balance.

1. Excretion or retention of ions by the kidneys.
2. Exhalation or retention of CO2 by the lungs.
3. Metabolic production of acids by the tissues.
4. Concentration of proteins in the blood.

We have already discussed briefly these first two mechanisms. In order to understand the latter two, we must begin our study of dietary influences upon the body's acidity and alkalinity.

3. Acid And Alkaline In The Diet

When nutritionists talk about acid- or alkaline-forming foods, they are referring to the condition of the food after ingestion. There are many food substances which are acidic in their natural form that become alkaline when broken down within the body.

A physical description of an acidic substance would be "sour or sharp to the taste buds." Litmus paper is a simple means to determine whether a substance is acidic. Acidic substances such as vinegar, lemon juice, grapefruit juice, tomato juice, tea, coffee or sour milk will all turn blue litmus paper red. The red coloration is an indication of the substances acidic characteristics. Alkaline substances, on the other hand, will cause red litmus paper to turn blue. However, when acid and alkaline substances are mixed together, they neutralize each other, forming water and salt.

Generally speaking, the metabolic processes of the breakdown of foods from the vegetable kingdom change in character from acidic to alkaline, while the foods from the animal world change from alkaline to acid during metabolism.

All foods contain within them a combination of both acid-forming and alkaline-forming elements. The particular influence a food will have on pH will be determined simply by which elements are dominant, the acid elements or the alkaline elements. These elements, when broken down, will either release (H+) ions, and thus create an acidic medium, or they will accept and combine with (H+) ions, creating an alkaline medium.

Keep in mind the following basic concepts:

1. Organic matter is taken into the body in the form of food.
2. This organic matter is broken down into simple compounds (monosaccharides, amino acids, lipids etc).
3. After metabolism, these compounds leave an acidic or alkaline residue in the body.
4. The simple compounds contain elements such as sulphur, potassium, sodium, magnesium and calcium. These minerals determine the H+ concentration and thus the acidity or alkalinity of the body.

These elements are either acid-forming elements or alkaline-forming elements. The acid-forming substances are sulphur, phosphorus and chlorine, while the alkaline formers are sodium, potassium, calcium, magnesium and iron.

Most proteins contain sulphur, as well as phosphorus, within their chemical structures. When metabolized, these substances are broken down into phosphoric acid and sulphuric acid, which must then be neutralized through various chemical reactions. Another by-product of protein metabolism is uric acid. (Uric acid has been found to have a major influence on the development of arthritis; in particular, gouty arthritis.) Uric acid must be neutralized and excreted from the kidneys. Because of these toxic by-products of protein metabolism (phosphoric, sulphuric and uric acids), and for many other reasons not mentioned here, protein foods, and especially animal products, are acid-forming. Most grains and dairy products, also high in protein, are, like meats acid-forming.

Within the plant kingdom, the organic acids found in fruits and vegetables are metabolized and eventually become carbon dioxide and water. The alkaline elements such as potassium, calcium, sodium and magnesium remain. Although many fruits are acidic in nature, when broken down into their constituent elements, the acids are rendered neutral and the alkaline elements are dominant. Therefore,

the end result of the organic breakdown and digestion of fruits and vegetables is alkaline in nature.

Since we are constantly supplying acids and alkalies to our bodies through the various foods we eat, it is very important that we consider the balance between these two extremes. If we consume excessive amounts of acid-forming foods, such as animal and dairy products, the body must tap its alkaline reserves (buffer salts) in order to maintain the proper pH. The kidneys, lungs and entire physiology is overworked in the process of excreting the neutralized acids from the body. This strain eventually leads to a depletion of buffer salts and the breakdown in the physiological functions of various organs, including the kidneys. Many different organ malfunctions are referred to as "disease," while the underlying cause, acidosis (due largely to faulty diet), has been overlooked. The point to keep in mind is that any food, drug or condiment that is extremely acidic in nature utilizes alkaline reserves and overworks the various organs. This type of dietary abuse may be tolerated for a period of time, but eventually the body will no longer be capable of handling this overload and will slowly begin to break down.

Following is a reference list categorizing some common foods as being either acidic or alkaline within the body.

ACID FORMERS

Most Grains	Fish*
Beef*	Cheese*
Poultry*	Eggs*
Most nuts (walnuts, pecans, brazils)	
Most legumes (peanuts, lentils)	

(* Not wholesome foods)

ALKALINE FORMERS

Vegetables	Fruits
Greens (lettuce, spinach, etc.)	Citrus fruits
Carrots	Bananas
Tomatoes	Melons
Potatoes	Strawberries
Celery	Apples
Cabbage	Apricots

Broccoli	Figs
Beets	Dates
Sprouts	Plums
Peaches	Pears

Foods that are beneficial in maintaining body pH are fruits and vegetables (preferably in their raw form), plus unprocessed nuts and seeds.

I have refrained from giving you a complete list of all the specific acid and alkaline-forming foods, because this author feels that it is most important for you, as a student of Natural Hygiene, to grasp the major concepts and apply them to your life. Please refer to *Composition and Facts About Foods* by Ford Heritage for more specific details.

The following rules will supply a conceptual basis from which to apply the dietary philosophy of Natural Hygiene.

FOODS TO AVOID

a. All animal foods.
b. Dairy products, including milk, yogurt and cheese.
c. Vinegar and various condiments.
d. Drugs (acidic and alkaline).
e. Refined and processed foods. (Many alkaline elements have been removed.)
f. Fats. (found in both meat and dairy products.)
g. Teas, coffee, cocoa and chocolate.

FOODS TO EAT

These should be fresh and unprocessed.

a. Uncooked vegetables.
b. Fresh fruits.
c. Unroasted nuts and seeds.

If you simply follow these rules, your body will benefit from a diet rich in all the essential proteins, fats, carbohydrates, vitamins and minerals. It will do this without having to deal with foods that deplete alkaline reserves and simultaneously overwork the buffer systems and organs of the body. These simple rules, combined with all the other areas of Natural Hygiene, will insure a condition in which your body can maintain a balanced state of health and well-being.

4. Acute Conditions Involving Acid Alkaline Imbalances

Every year the number of prescriptions written for acid-alkaline imbalances continues to increase. Antiacids, alkalizers, specific digestive enzymes, etc. remain popular as household "remedies" for many acute digestive disorders. The temporary relief experienced by these so-called remedies is interpreted by

the majority of sufferers as being a cure for the problem. Nothing could be further from the truth. These drugs work in much the same way as a lazy housecleaner sweeps the dust under the rug; that is, covering up the symptom, but not eliminating the cause.

Our bodies are like the rug in that they will only allow the drugs to cover up the problem for so long. Eventually, these acute digestive disorders will become chronic, resulting in a more difficult condition for the body to deal with. So, what was once simply a minor case of acid indigestion or heartburn becomes a major digestive ailment. The stomach, liver, small and large intestines, kidneys and pancreas can all be seriously impaired, both from consumption of an improper diet and from the use of drugs that cover up an overly-acidic diet and the, consequent indigestion.

Almost anyone who has been eating the standard diet of meat, dairy foods and refined and processed foods will suffer in varying degrees from an acid-alkaline imbalance. Add to this fare: alcohol, cigarettes, drugs and condiments, and the percentages will rise even higher. As a Hygienic practitioner, you will begin to witness miraculous results when working with people suffering from these acute imbalances.

5. Case Histories Of Acid Indigestion Due To Improper Diet

5.1 Case #1

A young female, age 26, came to my office complaining of a dull, aching stomach pain. This pain seemed to manifest whenever she ate a large meal. At times this pain would work its way up the esophagus, causing discomfort under the ribs and around the heart.

These symptoms, along with lack of vitality, occasional constipation and mood fluctuations, had been plaguing the patient for about eight months. Investigation into her diet indicated that she was consuming a great deal of dairy products and sweets. After placing the client on a short fast, her diet was changed to include mostly fruits, vegetables, nuts and seeds. I also put her on an exercise program. After three weeks, the client's pain had completely subsided and her vitality, mood swings and constipation had improved dramatically.

5.2 Case #2

A male client, age 31, entered my office complaining of severe gas whenever he ate. He was also passing pieces of food in his stools, indicating an imbalance in the digestive juices. This condition has been going on for about three years and was gradually becoming worse. A case history showed that the client was consuming dairy products, refined sugar and some meats in excess, as well as combining his foods improperly.

The client was placed on a fast and then placed on a Hygienic diet with proper food combining. Gradually, over the next month-and-a-half, the client's condition improved to the point where his stools were normal and he was no longer experiencing his gas problem.

5.3 Case #3

A 32-year-old female came to me complaining of multiple problems. She had been suffering from

bladder infections for over eight years. Along with this, she was taking allergy shots twice weekly and digestive enzymes to aid in her sluggish digestion. The client was unable to eat food without experiencing an "allergic" reaction and a flair-up in her bladder region. Her mood swings were radical, depending upon what she ate, and she periodically lost her ability to concentrate.

Her case history showed that she was eating a very inconsistent diet, rotating her foods to reduce allergic sensitivity to them. After a five-day fast the client was placed on a Hygienic diet and on an exercise program, and she began fasting one day a week. Within a month she was off her allergy shots and digestive enzymes. Her bladder was feeling much better, and within two months her symptoms had completely disappeared.

6. The Acid-Alkaline Ratio In The Diet

The body will maintain a proper pH balance at all times because it must do so for proper functioning. The organism is designed that way. In order to make the body's job easy—and so expend less energy and have more energy for other activities, the diet should consist of foods that have an appropriate acid-alkaline ratio, at least 80% alkali and not more than 20% acid.

This balance is maintained by the lungs, kidneys and buffer salts. However, to limit the wear and tear on the lungs and kidneys, and so as not to deplete the body's buffer salts, our diet should consist of foods that best match our organism's acid-alkaline ratio. A diet of fresh ripe fruits, along with raw vegetables and nuts and seeds, is optimum. The amount of nuts and seeds in the diet should, of course, be rather small relative to the less concentrated foods—fruits and vegetables. Also, the amount of vegetables should be smaller than the amount of fruits because fruits provide the calories we need, whereas vegetables do not.

Fruits should be eaten alone or with each other at a meal, and vegetables can be eaten at a meal with either nuts, seeds or avocados. An example of a menu that insures a good acid-alkaline balance is as follows:

Breakfast: Melon

Lunch: Grapes, bananas and dates

Dinner: Large vegetable salad of lettuce, tomatoes, avocados, broccoli and sprouts

The important point to keep in mind is that the alkaline-forming foods are the most natural and beneficial foods for humans. As a Hygienic practitioner, it is important to understand that even if some people will not completely adhere to a totally Hygienic regime, any improvement in the acid-alkaline ratio will be an improvement of their well-being.

7. Considerations When Working With pH Imbalances

When a client comes to you complaining of fatigue, nervousness, insomnia, hyperactivity, emotional swings, lethargy, frequent colds, abdominal discomfort, etc., it's fairly certain that part of their problem is an acid-alkaline imbalance. If this is the case, you, the Hygienic practitioner, must educate your client and help him to eliminate the causes of his problem. You should start out by explaining that the two major reasons for their particular problem are:

1. Too many concentrated proteins in the diet; that is, meat, eggs, milk, fish and cheese;
2. Overconsumption of foods that have been processed and refined and are thus deficient in alkaline elements.

It is important to explain the benefits of a more alkaline diet and how it is truly the only way to eliminate the cause of their problems.

The Hygienic practitioner should also take into consideration the client's overall vitality. If their digestive systems are in a weakened state, a fast may be in order. This will allow the organism to rest, get rid of toxins that interfere with normal functioning and to regain normal functioning abilities.

If a client complains that he or she suffers indigestion when he or she eats acid fruits such as oranges, grapefruits, pineapples, etc., he or she will benefit by fasting. People who have this difficulty have impaired digestive abilities due to past practices and diet. Again, a fast will enable the organism to regain normal functioning abilities.

Even if a client is unable or unwilling to fast for any reasons, he will still improve by staying on a healthful diet of fruits, vegetables, nuts and seeds. However, improvement will occur more slowly than if the client fasts. Nonetheless, as the client's condition improves, he will find it easier and easier to eat and enjoy these wholesome and delicious fruits.

If your clients will adhere to the basic Hygienic format, they will experience major transformations in their health and well-being. Not only will the major symptoms clear, but your clients will become increasingly disease-free and will find that the quality of their lives will dramatically improve. It is necessary that we preserve our pH at a level of maximum physiological efficiency, and this can be achieved easily through the Hygienic program.

The following is a sample of a basic three-day plan:

DAY ONE

Breakfast Oranges
Lunch A fresh green salad with romaine lettuce, broccoli, cabbage and tomatoes Dressing: either lemon juice or an avocado mixed with lemon

Dinner Fresh fruit salad of bananas, apples, nears and chopped pitted dates

DAY 2

Breakfast Citrus fruit(s) or pineapple

Lunch Assorted sliced fresh fruits: bananas, peaches, apples, pears

Dinner 3-4 oz. Pecans Vegetable salad with tomatoes sprouts, celery, and lettuce

DAY 3

Breakfast Grapes

Lunch Green salad with vegetables: romaine lettuce, cauliflower, broccoli, cucumbers and avocado with

lemon juice

Dinner Assorted sliced fruits: Apples bananas, cherries, mangos, nectarines, etc.

Eating raw foods can be fun! People forget what an assortment of delicious raw foods there are.

Keep in mind that you should always eat melons alone. There are so many different kinds of delicious melons: honeydew, cantaloupe, crenshaw, sharlyn, cassaba, watermelon. The body digests melons very rapidly, and thus many people find them to be the ideal breakfast food.

8. Questions & Answers

I got the impression that the "acid-forming elements" and the "alkaline-forming elements" you refer to are particular minerals, the acid-forming ones being sulphur, phosphorus and chlorine and the alkaline-forming ones being potassium, sodium, calcium, magnesium and iron. Why is the study of acid and alkaline separate from the study of minerals?

> Your impression is correct. Also, your question is a good one. It is important to remember that the human organism is a whole entity, even though it is composed of various glands, systems, etc. Also, foods are whole, even though they are composed of carbohydrates, fats, proteins, vitamins and minerals. Yet, it is customary and convenient to study the various parts of the whole, always keeping in mind that the whole is greater than the total of all its parts.
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> The subject of acid and alkaline should have been at least briefly discussed in the lesson on minerals. But is an important and large subject that also warranted a lesson in itself. Hence, this lesson!

You said to avoid refined and processed foods because these foods are lacking in alkaline minerals. Does this mean that refined and processed foods are acid-forming?

> No. Refined and processed foods are usually devoid of both the alkaline minerals and the acid minerals. This means they are more likely to be neutral than acid-forming in the diet. However, like the acid-forming foods, foods devoid of most minerals upset the acid-alkaline ratio of the body, but in a different way: Vitamins and minerals are needed for the metabolism and consequent efficient use of foods eaten. When carbohydrates are eaten, but the nutrients needed in their metabolism and utilization are not supplied in the way that nature intended, the body must draw upon its reserve supplies and then on the minerals in the bones and teeth. Since the body's reserve supplies are quite limited, consumption of refined and processed foods results in minerals being drawn from bones and teeth and in a myriad of health problems, from hypoglycemia and diabetes, to dental caries, osteoporosis, nervousness and depression.
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> The reason why the body does not keep a larger reserve of vitamins, minerals, etc. for metabolism of refined and processed foods is obvious: We are not naturally designed for eating fragmented foods; that is, foods that have had some components removed in processing or refining.

People who advocate a macrobiotic diet claim that rice is the perfect food in that it best harmonizes with the body's needs as regards acid and alkaline. Yet the macrobiotic diet is entirely different from the Hygienic diet—and you do not advocate the use of rice in the diet at all! Please explain.

In a diet based on grains, rice is one of best of the grains as regards the acid-alkaline Indeed, it is far less harmful in the diet than is wheat, the Western world's staple grain. In that regard, the macrobiotic diet is less harmful than the conventional American diet. In fact, the macrobiotic even has a few things in common with the Life Science (natural) diet: For one, neither dietary regime, in its pure interpretation, advocates sweeteners of any kind. Nor does either dietary school advocate dairy foods, eggs or meats (except fish, in the case of macrobiotics).

However, it must be understood that macrobiotics is based on tradition, economic lack and many false premises, whereas the Life Science regime is based on science and nature and not upon economic considerations or tradition. Sea salt is advocated by the macrobiotic school. However, scientific fact is that all salt in inorganic form, which sea salt and rock salt both are, is poisonous and is responsible for many diseases and health problems. This is why soy sauces and miso, both containing salt, are very harmful foods. Rice is rather bland without soy sauce or other flavorings. Also, it has to be cooked, a distinct health disadvantage. Rice is deficient in water and in the wide variety of vitamins and minerals that can be found in fresh raw fruits and vegetables. Rice also lacks the flavor and the attractiveness of fresh fruits and vegetables. Just looking at a few of the facts, you can readily see which foods nature intended for humans and which came to be used by humans as a result of lack, ignorance and tradition.

Macrobiotic cooking also uses oils for sauteeing foods and for making tempuras.

That's correct. As you have learned in previous lessons, heated oils are very toxic within the human organism and lead to many serious diseases, including cancer.

Will including grains in the diet disturb the body's acid-alkaline balance?

First, we should repeat that the body has built-in buffer systems for maintaining its normal pH balance. Most foods will stimulate these systems to maintain normal pH. However, some foods cause the body's buffer systems to work extra hard because certain foods (those not normal and correct to the human dietary) render too many acids upon metabolism, most notably, meats, dairy products, eggs, etc.

Grains are also acid-forming, as a rule. Therefore, if you eat them, eat them in extreme moderation (nor more than once every two or three days). We recommend that you have your grain portion in place of a portion of nuts, seeds or avocados, since grains are very poor combinations with these foods. Grains, if eaten, should be consumed with raw nonstarchy vegetables and not with fruits or sweeteners. Nor should they be salted because, as stated earlier, salt is poisonous in the human organism and leads to health problems.

Isn't it okay to use a little baking soda (sodium bicarbonate) mixed with distilled water in case of indigestion that may occur even if foods are correctly combined or in cases where incorrect combinations cannot be avoided, like when you're a guest at someone else's house?

Absolutely not! Baking soda and all commercially-sold antacid preparations are very harmful when taken often, for they cause alkalosis by depleting the body's acid-forming minerals. Remedies of any kind should never be used! The law of dual effects says that a secondary effect follows on the heels of the primary effect of any drug (baking soda is one).

What this means in this case is that a worse case of indigestion will occur in the next meal after the baking soda was used.

You should always avoid incorrect combinations, even when you are a guest at someone else's house. Correct combinations are usually possible or can be politely requested. You may have to pass up certain dishes or pass up invitations if you really want to become and/or remain healthy.

If you get indigestion despite correct food combining, you would benefit by a fast. A fast will give your digestive system a chance to rest and heal so that it can better do its job. It is also advisable to eat smaller meals, to chew your food well, to eat easy-to-digest foods such as raw fruits and vegetables and to be sure you are relaxed during mealtime. Your food will digest best if you do not exercise very vigorously immediately before or after a meal and if you are not overly stressed or anxious before, during or after your meal.

Article #1: Alkalinity And Acidity Of Foods In Metabolic Reaction

When foods are eaten, they are oxidized in the body resulting in the formation of residue or ash. In this residue if the minerals sodium, potassium, calcium and magnesium predominate over sulfur, phosphorus, chlorine and uncombusted organic acid radicals, they are designated as alkaline ash foods. The converse of this is true for foods designated as acid ash.

Numerical values of alkalinity or acidity are determined in long, painstaking analytical laboratory work. The concentrations of the various elements are determined separately and then computed in terms of equivalents. The excess of one group of minerals over the other is expressed as cubic centimeters of normal acid or base (alkaline) per 100 grams edible food. The values obtained are called degrees of acidity or alkalinity.

(most alkaline reaction)	
43.7	Fig, dried
41.6	Lima bean, dried
36.6	Apricot, dried
25.3	Raisin
20.4	Swiss chard
20.3	Prune, dried

17.5	Dandelion greens
16.4	Soybean sprouts
15.8	Spinach
15.0	Taro corms & tubers
14.2	Cucumber
14.0	Lima bean, fresh
13.5	Almond
12.1	Peach, dried
11.1	Beet
10.7	Avocado
10.5	Kale
10.4	Chive
10.2	Carrot
10.2	Rhubarb
9.9	Endive, (escarole)
9.6	Date
9.1	Chestnut
8.6	Parsnip
8.5	Granadilla
8.5	Lemon with peel
8.5	Coconut meat, dry

8.5	Rutabaga
8.4	Onion, mature dry
8.3	Tomato, ripe
8.2	Peach, fresh
8.2	Plum
8.1	Celery
8.1	Watercress
7.7	Blackberry
7.7	Guava
7.7	Lemon
7.7	Bamboo shoots
7.7	Iceberg lettuce
7.5	Cantaloupe
7.5	Coconut milk
7.4	Loganberry
7.4	Pea, dried
7.3	Sweet cherry
7.3	Leek
7.2	Potato
7.1	Orange
7.0	Lettuce: Cos, Losseleaf

6.7	Pricklypear
6.7	Sweet potato
6.6	Apricot, fresh
6.5	Turnip
6.4	Grapefruit
6.2	Nectarine
6.2	Common cabbage
6.0	Banana
6.0	Coconut meat, fresh
6.0	Kohlrabi
5.8	Pineapple
5.7	Raspberry
5.7	Tangerine
5.5	Gooseberry
5.0	Mango
4.9	Quince
4.9	Mushroom
4.8	Sapodilla
4.0	Sour red cherry
4.0	Lemon juice
3.9	Red cabbage

3.5	Pomegranate
3.4	Pear, fresh
3.2	Cauliflower
3.2	Chicory
3.2	Pumpkin
2.8	Winter squash .
2.7	Grapes
2.7	Savoy cabbage
2.6	Strawberry
2.2	Apple
2.2	Watermelon
1.8	Sweet corn
1.3	Pea, fresh green
.1	Olive oil
	(neutral reaction)
.1	Asparagus
.2	Chinese waterchestnut
.8	Sorghum grain
1.4	Blueberry
2.1	Filbert
2.3	Cress

4.8	Snap bean
4.8	Radish
4.5	Orange juice
4.5	Eggplant
4.5	Okra
4.3	Brussels sprouts
4.2	Broccoli
4.2	Horseradish, raw
3.2	Brazilnut
3.8	Oliver, green pickled
4.3	Artichoke globe
4.3	White bean, dried
7.8	White rice
8.5	English walnut
10.3	Jerusalem artichoke
10.5	Lentil
10.6	Peanut
10.9	Wheat grain
11.3	Rye grain
	(most acid reaction)

From Composition and Facts About Foods

Article #2: Acid/Alkaline: Clearing Up The Confusion By Marti Fry

The purpose of this article is to clearly and simply explain the meaning of *acid* and *alkaline* and to explain why a study of the acid-alkaline balance, or pH balance, is important in the study of health and healthful living.

Acid and alkaline are words used to differentiate two classes of minerals with differing chemical compositions. One class of minerals contains a relatively large number of hydrogen ions. These minerals are the acid-forming minerals. They include sulphur, phosphorus and chlorine. The other of these two classifications of minerals contains a relatively small number of hydrogen ions. These minerals are the alkaline-forming minerals. They include potassium, sodium, calcium, magnesium and iron.

Substances contain both acid-forming and alkaline-forming minerals. Whether a substance is classed as acid or alkaline depends upon which type of minerals predominate in the substance. Substances that have approximately equal amounts of acid and alkaline (base) minerals are neutral. Water is neutral.

Foods may be acid before ingestion but alkaline after metabolism, or they may be alkaline before ingestion but acid after metabolism. The former is generally true for fruits and vegetables, while the latter is generally true for animal foods.

The human body is maintained slightly alkaline, and alkaline foods are our normal diet and therefore a healthful diet. When we refer to alkaline foods, we mean foods that leave an alkaline "ash" after metabolism—fresh fruits and vegetables, primarily, as well as some nuts and seeds. Ingestion of animal foods results in many acids, most notably uric acid, sulphuric acid and phosphoric acid. The presence of these acids causes the body's buffer systems (those organs that maintain normal body pH) to work extra hard, whereas the consumption of fresh fruits, vegetables, nuts and seeds does not overwork the body.

The body's major buffer organs are the kidneys and the lungs. If either of these organs is impaired for any reason, or if a diet containing an excess of acid-forming foods is consumed, acidosis may occur. Acidosis is by far more common than alkalosis. An excess of acid-forming foods does not directly result in acidosis, however. Rather, this practice results in overworking the kidneys and lungs and depleting the body's supply of buffer salts. Then the body's ability to neutralize excess acids from acid-forming foods becomes impaired.

Alkalosis may result from lung or kidney impairment or from overbreathing, but it does not result from consumption of too many alkaline-forming foods, as there is no such thing as too many alkaline-forming foods. These foods are our normal dietary and they always contain a proper balance of base (alkaline) and acid minerals. Alkalosis may occur, however, if antacid preparations are frequently taken.

Acidosis and alkalosis are both pathological conditions that need never occur. However, acidosis is rather common because so many people consume a diet heavy in acid-forming foods such as meats, milk, cheese, eggs, etc. and because so many refined foods are consumed (sugar, flour, rice, wheat, etc.).

Acidosis is the predecessor to almost all, if not all, diseases. This is not because acidosis causes diseases, but the same unhealthful practices that result in acidosis also are the causes of diseases. Illnesses are body processes to set a wrong internal situation right. They are carried on by the body in order to eliminate harmful toxins and to correct imbalances, including over-acidity in the body. Therefore, no "cures" should be sought. The body should be left alone to carry out the cleansing process without interference from drugs, foods, etc.

If you suspect that your body is overly acidic, all you need do is fast one to five, days and/or consume

only fresh fruits and vegetables, uncooked and without seasonings of any kind. The body is fully capable of correcting all internal imbalances and will automatically do so as soon as the cases of the problem are removed (and, in some cases, before the causes of the problem are removed, as a matter of life or death).

From a practical standpoint, you need not concern yourself with the degree of acidity or alkalinity of the foods you eat. Just eat a wholesome diet of uncooked fruits, vegetables, nuts and seeds, and you will be providing your body with exactly the kind of nourishment it needs and was designed to handle.